INVESTIGATION REPORT

ADMINISTRATION

OF

PUBLIC EXAMINATIONS

March 2002

Office of The Ombudsman

Hong Kong

CONTENTS

EXECUTIVE SUMMARY

Chapter		Page
1	**INTRODUCTION**	
	Background	1
	Purpose and Ambit	1
	Methodology	2
	Report	3
2	**ADMINISTRATIVE FRAMEWORK**	
	The Public Examinations	4
	Hong Kong Examinations Authority	4
	Question Paper Development Process	7
	Observations	13
3	**FLAWS IN THE 2001 EXAMINATIONS**	
	Introduction	15
	Flaws in Question Papers	15
	Flaws in Listening Test Arrangements	16
	"Special Notice" Cases & Papers Reprinted	17
	Cases Not Involving Errors	18
	Observations	19
4	**PROOFREADING OF QUESTION PAPERS**	
	Background	21
	Observations	22
5	**QUESTION-SETTING**	
	Originality of Questions	26
	Case 4	27
	Observations	27
6	**LISTENING TESTS**	
	Background	29
	Observations	31

Chapter		Page
7	**GENERAL ADMINISTRATION**	
	Staff Attitude and Professionalism	34
	Staff Management	37
	Training and Guidelines	40
8	**REMEDIES AND IMPROVEMENT INITIATIVES**	43
9	**CONCLUSIONS AND RECOMMENDATIONS**	
	Conclusions	45
	Recommendations	46
10	**FINAL REMARKS**	
	Comments from HKEA	50
	Final remarks from the Ombudsman	51

APPENDICES

A Case 1: CE Physical Education Paper 2

B Case 2: AL History Paper 1

C Case 3: AL Pure Mathematics Paper 2

D Case 4: AL Geography

E Case 5: CE English Writing

F Case 6: AL Computer Studies Paper 1

G Case 7: ASL Computer Applications Paper 1

H Case 8: CE Chinese History Paper 2

I Case 9: AL Use of English, Listening Test

J Case 10: CE English Language, Listening Test

K Errors Corrected by "Special Notices"

1

INTRODUCTION

BACKGROUND

1.1 In the course of the two major public examinations – the Hong Kong Certificate of Education Examinations (HKCEE) and the Hong Kong Advanced Level Examinations (HKALE) - in 2001, a number of problems surfaced with the question papers and the administrative arrangements. In view of the community's concern and the importance of a reliable examinations system, The Ombudsman decided to instigate a direct investigation pursuant to section 7(1) of The Ombudsman Ordinance (Cap. 397). The investigation was announced on 18 May 2001.

PURPOSE AND AMBIT

1.2 This direct investigation examines the following matters :

(a) problems relating to the question papers and the conduct of the examinations in 2001;

(b) in light of (a), adequacy of the current

arrangements for the administration of the examinations, including the supervisory mechanism; and

(c) areas for improvement.

METHODOLOGY

1.3 The investigation, conducted with the full cooperation of the Hong Kong Examinations Authority (HKEA), comprises three stages :

(a) In the first stage, the present system was ascertained through briefings by the Deputy Secretary of HKEA and study of relevant papers, records, reports, manuals and statistical data;

(b) In the second stage, 29 persons[1] who had participated in preparing question papers and making administrative arrangements for the examinations in 2001 were interviewed to find out the causes of the problems in the examinations. The opportunity was also taken to gather their views on various aspects of the administration of the

[1]Including nine Chief Examiners, seven Moderators, two Assessors, three Question Setters, seven Subject Officers and a Senior Administrative Assistant of HKEA.

examinations.

(c) In the third stage, meetings were held with senior officials of the HKEA Secretariat, namely the Secretary, the Deputy Secretary and the Head of Subjects Division, to hear their views.

We have also taken reference from the report of the task group appointed by HKEA to investigate into the errors in the A-level History and A-level Pure Mathematics examinations[2].

REPORT

1.4 The draft investigation report was sent to HKEA for comments on 5 March 2002.

[2] The three-member task group was chaired by Dr Michael Halstead, Group Chief Executive of the University of Cambridge Local Examinations Syndicate, and comprised Legislative Councillor Mr Lau Ping-cheung and President of the Hong Kong Society of Accountants Mr Andy Lee Shiu-chuen,.

2

ADMNINISTRATIVE FRAMEWORK

THE PUBLIC EXAMINATIONS

2.1 HKCEE and HKALE are the two most important public examinations in Hong Kong. They are acknowledged by local schools and universities as well as overseas institutions as valid and reliable means for assessment of student ability for higher education and by employers for recruitment of staff. It is of utmost importance that the high level of public confidence and recognition is maintained.

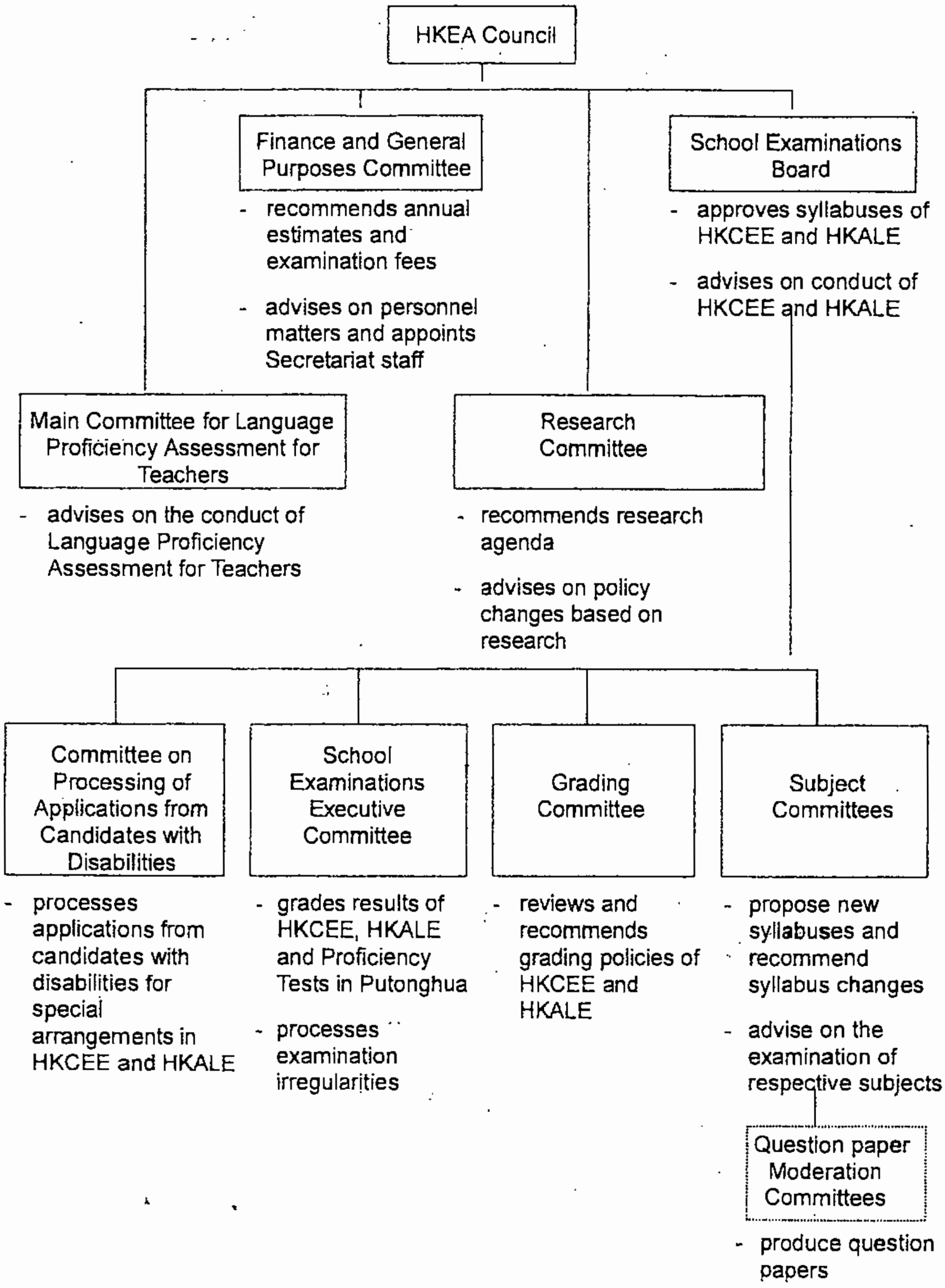
HONG KONG EXAMINATIONS AUTHORITY

2.2 HKEA, an independent organisation set up under the Hong Kong Examinations Authority Ordinance (Cap. 261), is given powers to plan and conduct examinations in Hong Kong. While in recent years HKEA has taken on other examinations, the administration of HKCEE and HKALE remains its primary responsibility. Its organisation is briefly explained below for a better understanding of the investigation.

2.3 The governing body of HKEA is its Council. Comprising 28 members from schools, tertiary institutions,

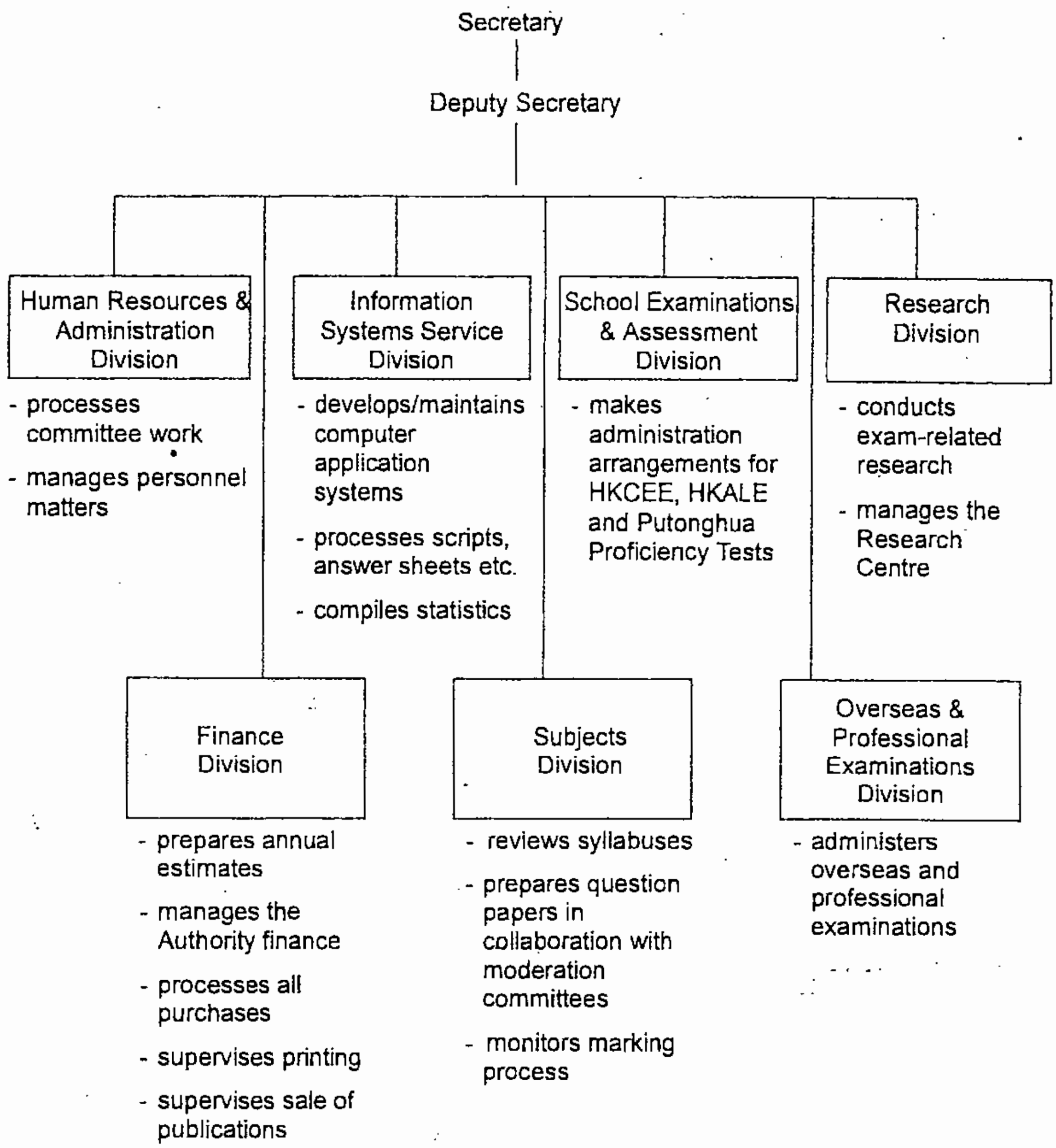
other education bodies and commerce and industry together with Government officials, the Council makes the policies and directs the activities of HKEA. Various committees have been set up to advise and assist the Council in the different areas of its work.

The HKEA Council and its Committees



2.4 HKEA is serviced by a secretariat of 170-strong on day-to-day business. Headed by the Secretary, the secretariat makes all the practical arrangements for the conduct of the examinations. It has seven divisions which implement the policies and decisions of the Council and its Committees.

Organisation of the HKEA Secretariat



2.5 For this investigation, the School Examinations Board (responsible for advising the Council on the conduct of the examinations), the Subjects Division (responsible for preparing question papers) and the School Examinations & Assessment Division (responsible for administrative arrangements for listening tests) are particular focal points.

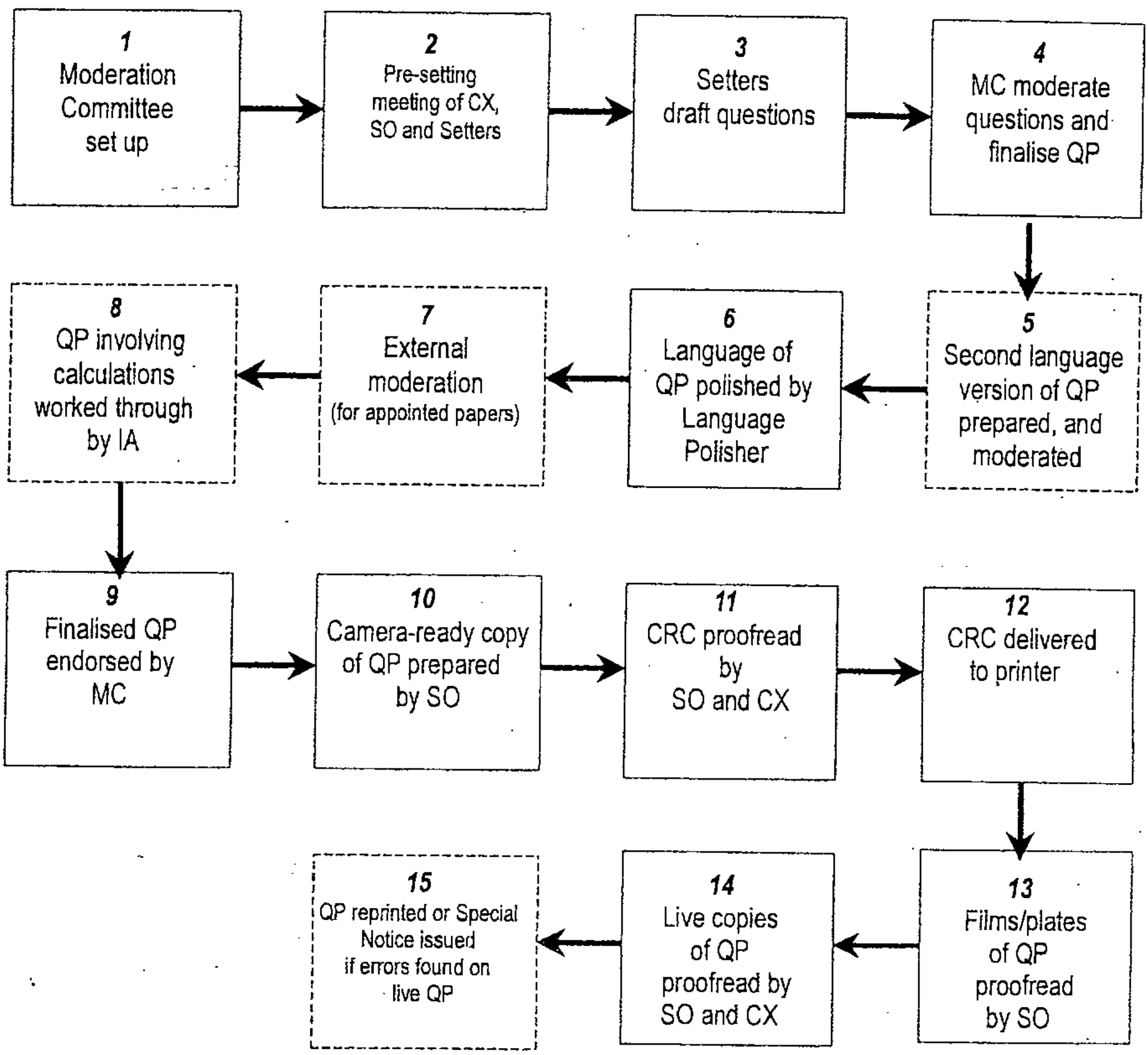
QUESTION PAPER DEVELOPMENT PROCESS

2.6 Most of the problems with the examinations in 2001 were related to flaws in question papers. In 2001, a total of 292 papers were produced for 70 subjects in the two examinations[3]. The procedures for the preparation of question papers are set out below.

[3] There were 160 question papers for 41 subjects in HKCEE and 132 question papers for 29 subjects in HKALE. The Chinese and English versions of a question paper are counted as two papers

Question Paper Development Process

Key: CRC: Camera-ready copy CX: Chief Examiner IA: Independent Assessor
MC: Moderation Committee QP: Question Paper SO: Subject Officer
[dashed box] step applicable to some, but not all, papers



Step 1

A Moderation Committee is formed for each question paper a year or more prior to its use in an examination. Depending on such factors as the complexity of the

subject and availability of suitable personnel, a Moderation Committee may comprise any number of members but not less than four. The chairman is the Chief Examiner, who is also in charge of marking arrangements for the paper. The Subject Officer is the only HKEA employee on the committee and serves as its secretary. The chairman and other members, participating on a part-time basis, are mostly experienced school teachers, university professors / lecturers and Inspectors / Curriculum Officers of the Education Department.

Steps 2 and 3

Setters, normally university lecturers and secondary school teachers, are invited to a pre-setting meeting with the Chief Examiner and the Subject Officer for discussion of general ideas about the form of the question paper. One paper will usually have more than one Setter, each being asked to set a number of questions on certain topics from the examination syllabus.

Step 4

The Moderation Committee reviews the questions presented by the Setters to consider each question in the context of appropriate level of difficulty, suitability of length, compliance with the syllabus and clarity of presentation. The Committee may amend the questions for balance across the examination syllabus and for any specific requirement in format. The process may involve up to 15 to 20 meetings before the draft paper is finalised.

Step 5

Most papers nowadays are examined both in Chinese and English. They are translated into the second language, by the Subject Officer or an appointed translator, after the original paper has been moderated. The paper in the second language must also be moderated by the Moderation Committee.

Step 6

When the Moderation Committee is satisfied with the questions, the paper

is passed to Language Polishers, who are Subject Officers specialising in the Chinese or English Language, for vetting. The Language Polishers' comments go back to the Moderation Committee for consideration.

Step 7

A selection of question papers is sent overseas for external moderation each year, on a rotation basis, for comments on substance and presentation. The External Moderators' comments are considered by the Moderation Committee, which decides whether to amend the paper further.

Step 8

For certain subjects, notably Mathematics and others involving calculations, an extra step is added to guard against errors. An Independent Assessor is appointed to work through the paper, as if he or she were a candidate. The Independent Assessor then compares the results with the marking scheme and solutions agreed by the Moderation Committee. The Subject Officer

considers the comments and, if necessary, alerts the Chief Examiner or even the whole Moderation Committee to decide whether changes are to be made to the paper.

Step 9

The Moderation Committee then endorses the final version of the draft paper to ensure it does not contain any mistake.

Steps 10 and 11

The Subject Officer prepares the camera-ready copy of the question paper when it has been finalised. The Subject Officer and the Chief Examiner carry responsibility for proofreading to ensure there is no remaining error.

Steps 12 and 13

The final version of the camera-ready copy is taken to the Government Printer. The film or plate of the question paper, prepared by the Government Printer, is proofread by the Subject Officer.

Step 14

Finally, after the paper has been printed,

live copies are proofread by the Subject Officer and the Chief Examiner.

Step 15

If an error is detected, the Subject Officer will consult the Head of the Subjects Division and the HKEA Secretary to decide whether to reprint the paper or to prepare a "Special Notice" to be issued with the paper, drawing candidates' attention to the error. Such a decision hinges on the nature and significance of the error and the time available for reprinting.

OBSERVATIONS

2.7 The question paper development procedures have been followed in Hong Kong for many years and are practised in a number of other territories.

2.8 In the case of the 2001 examinations, we have found that the problems lay not with the system itself, but rather with the way it was executed. For a system to be properly implemented it must be understood by those implementing it. We have found some people involved in the preparation of the 2001 question papers did not have a thorough understanding of the process and the purposes of the steps. In none of the

instructions or guidance notes issued to the examination personnel was the process explained. As will be shown later, this lack of understanding among some examination personnel contributed to the problems in the 2001 examinations.

3

FLAWS IN THE 2001 EXAMINATIONS

INTRODUCTION

3.1 During April and May 2001 when HKCEE and HKALE were in progress, there were reports from time to time about errors in question papers or flaws of an administrative nature. Based on reports in the media and information provided by HKEA, we were able to identify a list of such cases. Investigations were conducted into each of them. The findings are outlined in this chapter.

FLAWS IN QUESTION PAPERS

3.2 Flaws of different nature and varying gravity were found in eight question papers in the HKCEE and HKALE in 2001 either during or after the examinations[4]:

[4] For brevity and following common practice, where examination subjects or papers are referred to, "CE", "AL" and "ASL" are used for HKCEE, HKALE and the Advanced Supplementary Level respectively. ASL papers usually form part of the HKALE.

Case No.	Date of Exam	Question Paper	Problem
1	20 March	CE Physical Education	Wrong marks were indicated in a question
2	6 April	AL History	There was a discrepancy between the Chinese (1900-1945) and English (1919-45) versions of a question
3	20 April	AL Pure Mathematics	i. "(6-x)" was wrongly put as "(x-6)" ii. A question was suspected to be copied from a textbook
4	24 April	AL Geography	A question was based on a reference book
5	5 May	CE English Writing	The words "END OF PAPER" were left out
6	10 May	AL Computer	The example given in a question contained a mistake
7	10 May	AS Computer	The paper contained a number of language mistakes
8	11 May	CE Chinese History	A multiple-choice question did not provide a correct answer

Reports on these cases are at **Appendices A to H.**

FLAWS IN LISTENING TEST ARRANGEMENTS

3.3 In two cases, the administrative arrangements for listening tests were found to be problematic:

Case No.	Date of Exam	Question Paper	Problem
9	2 April	AL Use of English, Listening Test	Candidates taking the test at a centre, which experienced radio reception problems in the previous year, were adversely affected by poor transmission
10	4 May	CE English Language, Listening Test	Listening test was held at a school previously found to be unsuitable. Most candidates had to use "special rooms"[5]

Reports on these cases are at **Appendices I** and **J**.

"SPECIAL NOTICE" CASES AND PAPERS REPRINTED

3.4 In some cases, errors were found after the papers had been printed. In 21 cases, the errors were relatively minor and were corrected by "Special Notices" read out at the time of the examinations for candidates to make the necessary amendments. The papers and the errors are listed at **Appendix K**.

3.5 Two other question papers (AL Computer Studies Paper 1 and CE Computer Paper 1(Chinese version)) contained a number of errors, mostly related to language, and were reprinted shortly before the examinations.

[5] In every listening test centre there are one or more "special rooms" which are equipped with radios (transistor type larger in size and with stronger reception efficacy than those used by candidates) to broadcast the examination materials. Candidates having difficulties receiving the radio transmission with their own radios can request to take the test there.

CASES NOT INVOLVING ERRORS

3.6 In respect of another six cases reported in the press, we have found no flaw in the administration of the examinations. The findings are summarised below:

Date of Exam	Subject	Problem alleged	Findings
30 March	AL Chinese Language & Culture	Media reported about suspected leakage of questions	The Independent Commission Against Corruption investigated the case and found no evidence of malpractice.
18-20 April	AL Physics, Practical Examination	Complaints about instruments failing to function	Problems were due mainly to (i) candidates failing to use the instruments correctly, (ii) laboratory technicians failing to set up the instruments according to HKEA instructions or (iii) instruments becoming ineffective after repeated use. Sufficient guidance had been provided to schools by HKEA. Spare instruments were provided to cater for situation (iii). Mark adjustments were allowed in appropriate cases.
28 April	CE Putonghua Listening Test	Complaints about difficulties in receiving radio broadcast at a centre in Kowloon Tong	15 candidates complained about poor radio reception before the test started and were arranged to take the test in the "special room". Candidates were not adversely affected. The centre had been previously checked for radio reception efficacy and the result was satisfactory.

7 May	CE Mathematics	Air-conditioner was not turned on at a centre	The matter was reported by the press and HKEA received a complaint. The decision whether to turn on the air-conditioning was made by the examination supervisor at the centre. Other candidates in the same centre found the condition satisfactory.
8 May	CE Chinese Language	Temporary power failure at a number of centres in Kowloon	The power failure was caused by problems at the power supplier's installation. HKEA had provided guidance notes to centre supervisors on how to handle such contingency, and centres took action accordingly. Candidates at centres seriously affected were given mark adjustments.
21 May	CE Computer Studies	A letter published by the press suggested that a multiple-choice question did not include a correct answer.	In fact, the correct answer was included.

OBSERVATIONS

3.7 The number of errors found in question papers was high compared to previous years. The statistics for the years 1999 to 2001 are as follows:

Year	Cases of Serious Errors[6]	Cases of Other Errors	"Special Notices" Issued
2001	4	4	21
2000	0	3	3
1999	0	2	2

3.8 On the number of "Special Notices", HKEA has explained that the increase in 2001 was due to the more cautious approach being adopted. Some corrections were strictly not necessary but were still made in order to avoid criticism such as disparity between the Chinese and English versions. We note that certain cases may come under such category (e.g. Cases 10 and 16 in **Appendix K**), but in most other cases, it was appropriate for the errors to have been amended.

3.9 We have found that most of the mistakes were made initially by Subject Officers or Setters. Undetected in the moderation and proofreading processes, they finally found their way into the live question papers. The factors contributing to the errors will be discussed in the subsequent chapters.

[6] "Serious errors" are those that would affect the work of candidates and in respect of which remedial actions such as adjustment of marking scheme are required. Cases 2, 3, 6 and 8 in the chart under paragraph 3.2 above fall under this category.

4

PROOFREADING OF QUESTION PAPERS

BACKGROUND

4.1 Question papers, by their very nature, must be absolutely accurate. Any flaw will cast doubt on the validity of the paper and the entire examination system. Thus, meticulous proofreading is crucial in the question paper development process (paragraph 2.6).

4.2 In the process, after individual questions are set and moderated, every paper is checked at least three times before it is printed (by the Moderation Committee, Subject Officer and Chief Examiner respectively), and two further times after printing (by the Subject Officer and Chief Examiner) before it is used in an examination. Furthermore, papers involving calculations are worked through a further time by Independent Assessors before printing. The number and nature of the flaws in the question papers, however, suggest that the proofreading mechanism had, at least in those cases, failed to fulfill its functions. The papers were not checked with sufficient care and thoroughness.

4.3 There is no record available to us as to how and

when proofreading was done. However, in two cases (Cases 1 and 3) we were categorically advised that the Moderation Committees did not check through the final drafts of the question papers as a whole, as members did not meet again after they had scrutinised the questions one by one. In the two cases involving calculations (Cases 3 and 6), there was evidence that the Independent Assessors did not work through every step of the solution. Reports are at **Appendices A, C** and **F.**

OBSERVATIONS

Lack of Clear Understanding

4.4 In an exercise involving different persons doing the same job, it is important that every participant knows his role precisely. We have found that some parties involved in proofreading did not have a clear understanding of what they were required to do. This may to some extent be due to uncertainties in the instructions given to them. The following points were raised by people interviewed as examples:

(a) It was not clear whether Chief Examiners were expected to work through the calculations, as the guidance notes to them did not say so and Independent Assessors would have worked through the

questions already.

(b) It was not clear whether Chief Examiners should check the subject content of a paper as well as administrative details such as the time of the examination or the numbering of pages, as such details were better known to Subject Officers who would be expected to see to them in their own proofreading.

(c) It was not clear whether Independent Assessors had to record every step of their calculation in writing and how or by whom their work was to be checked.

(d) It was not clear by whom or at what stage the two language versions of a paper should be checked against each other for accuracy, as there was no such requirement in the instructions.

(e) A Chief Examiner said that he focused on the subject content rather than the language as he expected the language to be checked by Language Polishers.

4.5 We are not in a position to judge to what extent those were genuine doubts or just excuses for errors.

Examining the instructions issued by HKEA to the respective parties, we found no clear answers to points (a) to (d). As for point (e), there appears to be a misunderstanding. In HKEA's instructions to Subject Officers, it is stated that Language Polishers are not proofreaders so Subject Officers have to ensure the accuracy of all aspects of a question paper. However, the same point is not made in the instructions to Chief Examiners or Moderation Committee members. While we expect the parties to take the initiative to seek clarification in case of doubt, proper instructions to all examination personnel would have made those points clear.

Lack of Due Diligence

4.6 We have found that, in those cases where errors were found in the question papers, proofreading had not be done with the appropriate degree of care and diligence. Even where clear instructions regarding checking of question papers were given, they were not observed in those cases referred to in paragraph 4.3 above and in the following instances:

(a) Although the Subject Officers' Manual says that the Independent Assessor should not be provided with the marking scheme when he works through the questions, the Independent Assessor in Case 3 was provided with the marking scheme. (This could have "tempted" him to check the questions against the

marking scheme instead of working through the calculations himself.)

(b) Although the Subject Officers' Manual lists the words "END OF PAPER" and the examination time as specific items to be checked, the former was not checked in Case 5, and the latter was not checked before the papers were printed in three cases where "Special Notices" were issued (Cases 17-19 in **Appendix K**).

4.7 Some people interviewed suggested that additional proofreaders should be appointed from outside the Moderation Committees to check the papers with "fresh eyes". It is for HKEA to consider the practical need for such an additional step. However, we must caution against slack attitudes being made an excuse for introducing further procedures or resources. As we see it, the problems in 2001 lay not so much with the number of times the papers were checked, but with proofreaders failing to check with due diligence. Some errors, such as those in Cases 2, 3 and 8, cannot easily be detected by proofreaders not familiar with their development process. The primary duty of ensuring the accuracy of question papers should remain with Moderation Committee members, including the Chief Examiner and the Subject Officer.

5

QUESTION-SETTING

5.1 In respect of two question papers in 2001 (Cases 3 and 4, paragraph 3.2) the originality of certain questions was queried.

ORIGINALITY OF QUESTIONS

5.2 In its guidance notes for Setters, HKEA stipulates that questions should not "be directly based on", "consciously follow" or "closely resemble" any textbook, reference book or previous question papers. The same paragraph provides that when direct quotations, photographs, charts, diagrams etc. are included in any question, they should be reported to the Subject Officer on a prescribed "Source Form".[7] When handing in draft questions the Setter is required to sign a "Setter's Guarantee" to confirm compliance with the stipulation cited above.

5.3 In our view, the notes do not provide sufficiently clear guidance. Case 4 illustrates the problems it may lead to.

[7] The full text of the relevant notes is cited at **Appendix** D, paragraph (5).

CASE 4

5.4 In that case, the Setter had made use of materials in a reference book. He had reported the source of the materials, with photocopies, to the Subject Officer. As observed in **Appendix D**, the question was so similar to that in the reference book that a candidate who had read or done the question in the reference book would have an advantage over others who had not. The Setter, however, did not see any such problem.

OBSERVATIONS

5.5 We believe that the primary objective of the stipulation against using published materials is to ensure fairness. It will affect the credibility and validity of the examination if a question has been read or done by some candidates beforehand. It also reflects badly on the examinations body. It appears that the Setter was not conscious of these considerations when he drafted the question as he did. The Subject Officer also did not seem to bother and did not take any action although he had been informed of the source and provided with copies of the materials.

5.6 We accept that the Setter was unaware of the implications. The fact that he reported the source materials and provided copies to the Subject Officer suggests that he did not see anything improper. It is a common practice among

teachers to use reference materials for school examinations. The Setter might not be conscious that in a public examination, there was a greater chance for the published materials to have been read by some of the candidates and the requirement of fairness is much more stringent than in a school examination.

5.7 The crux of the problem, as we see it, is that the Setter was not sufficiently briefed on the particular stipulation. The guidance notes did not state the purpose of the policy sufficiently clearly. The meaning of the expressions "directly based on", "consciously follow" and "closely resemble" might not be readily apparent to a reader not trained or experienced in question-setting. Moreover, the reference in the same paragraph to the requirement for reporting sources makes it even more difficult for the reader to appreciate HKEA's intentions. Clearer instructions will prevent similar problems.

5.8 The question in Case 3, we are satisfied, did not involve any copying. (See **Appendix C**, paragraph (7) to (10)).

6

LISTENING TESTS

BACKGROUND

6.1 Listening tests are included in the following language subjects: CE English Language, CE Putonghua, ASL Chinese Language and Culture, and ASL Use of English. Test materials are broadcast through the radio. Candidates are required to bring their own radios to examination centres and listen to the broadcast by earphones.

6.2 The School Examinations & Assessment Division of the HKEA Secretariat is responsible for arranging examination centres, including centres for listening tests, which are selected according to the following procedures:

(a) For a school not previously used as a listening test centre, HKEA would send an inspection team, normally comprising one Chief Administrative Assistant and one Senior Administrative Assistant[8] to carry out a radio reception test. The team members use ordinary radios to test whether they can hear satisfactorily

[8] Senior Administrative Assistants are ranked equivalent to clerk Officers I, and Chief Administrative Assistants to Senior Clerical Officer.

from the channels which will be broadcasting the examination materials. A "centre visit report" will be prepared on which the team will indicate whether the school is suitable for holding listening tests.

(b) For schools previously used as listening test centres, reports from centre supervisors on how many candidates had to use "special rooms" in the previous year because of radio transmission problems would be considered by HKEA. Where the number indicates a problem the school would either be excluded, or HKEA staff would carry out another radio transmission test at the school. (For the 2001 examination, it was decided not to use any listening test centre where more than 20 candidates had used the special room in 2000.)

(c) Based on the "centre visit reports" (sub-paragraph (a)) and the centre supervisors' reports (sub-paragraph (b)), each centre is given a rating of 3 (suitable), 2 (low priority) or 1 (unsuitable). The rating is used as the basis for allocating listening test

centres for the two public examinations and is updated every year by a Chief Administrative Assistant before test centres are allocated.

6.3 Advice on the listening tests, including how to tune the radio for the best reception, is included in the "Handbook for Candidates" distributed through schools before the examinations. On the day of the listening test, candidates are allowed 45 minutes to tune their radios to the best frequency. Those having difficulty in receiving the broadcast can request to take the test in the "special room".

OBSERVATIONS

Broadcasting through Radio

6.4 HKEA has advised that, in view of the large number of candidates and test centres and the technical problems involved, broadcasting through radio is the most practicable means to conduct listening tests. However, we find the situation still requires improvement, as every year there are cases of candidates being affected in their performance by unsatisfactory radio transmission. In this connection, we note that HKEA is exploring alternative ways to conduct listening tests.

6.5 So long as radio broadcast is still used we believe

that HKEA should find ways to minimise the difficulties for candidates, e.g. using radio channels with better transmission efficacy.

Selection of Centres

6.6 Radio reception tests at schools are conducted by HKEA staff using ordinary radios because that gives a realistic idea of how clearly the candidates will hear at the time of the listening test. It had experimented with engaging experts for the test using specialist equipment, but that was costly and the result did not make significant difference.

6.7 The "flaws" in Cases 9 and 10, referred to in Chapter 3 (paragraph 3.3), expose problems of implementation in allocating listening test centres. In Case 10, the officer responsible for allocating test centres had neglected to check the "centre visit report". In Case 9, apparently the criterion that centres with more than 20 candidates having used the "special room" would not be used again was rigidly followed. That centre was relatively small (with a seating capacity of 150) and 20 candidates had used the "special room" in the previous year. Consideration should have been given to the proportion of candidates affected, not just the figure.

6.8 The mistakes in both cases could have been avoided if someone had checked the work of the Chief Administrative Assistants. Their work might be simple and straightforward but, in view of the importance of the examinations and the

impact of mistakes, there should be a system for checking against mistakes.

7

GENERAL ADMINISTRATION

7.1 This sets out our observations on the general administration of the two examinations by HKEA.

STAFF ATTITUDE AND PROFESSIONALISM

7.2 All examination personnel interviewed agreed that the flaws in the 2001 examinations could have been avoided if the persons involved had been more vigilant with their tasks. It was a question not of competence, but attitude. The Setter in Case 6 explained that had he been able to spend more time on the question, the mistake would not have been made. All those involved in the checking of the flawed question papers admitted that the errors could have been identified if they had checked more carefully.

Composition of Moderation Committees

7.3 A common point raised by most Moderation Committee members interviewed was that, because of the their own duties elsewhere, it was not always possible to devote as much time as they should to the work in relation to the examinations. A Chief Examiner, who was a university professor, was unable to attend most of the moderation meetings and had suggested

several times to resign but was persuaded to stay on by the Subject Officer. He realised that it was not an ideal situation but the Subject Officer convinced him that that was the best possible compromise.

7.4 Under the present system, Moderation Committee members are first nominated by members of the Subject Committee, who include officers of the Education Department, then selected and approached by the Chairman of the Subject Committee and the Subject Officer, and finally appointed by the Head of the Subjects Division on behalf of the HKEA Secretary. In practice most of the nomination and selection work is done by Subject Officers. Normally, the Subject Officer would try to retain past members and recruit new members among his acquaintances made in the course of examinations work. There is no open recruitment system. In some cases, members accepted appointment because of their working relations with the Subject Officers. Such a "system" has undesirable results: some Moderation Committee members may not take the task sufficiently seriously or could not afford sufficient time or energy for such work; on the other hand, people who are capable and interested may not have the opportunity to participate in the work because they are not known to the Subject Officers.

7.5 The "system" lacks transparency and cannot ensure that the most suitable persons are enlisted. The arrangement should be reviewed to ensure that:

(a) Moderation Committee members are able, and willing, to devote time and to discharge their duties to the high standard required; and

(b) people with the requisite qualifications, ability and interest have the opportunity to participate.

Without compromising the high degree of security essential to the examinations, the recruitment of Moderation Committee members should be open to all qualified persons and selection should be fair and objective.

Recognition and Appreciation

7.6 A strong sense of commitment is needed for Moderation Committee members to achieve a consistently high-quality and error-free result. Members are remunerated[9] but most already have important roles in education institutions. Moderation Committee members as well as the HKEA management regard participation as a contribution to the development of education and a form of service to the community. A number of members have, however, mentioned they did not see their involvement to be valued by HKEA. Throughout the years, their contact with the HKEA was the Subject Officer, and the only reward was the pay cheque. They have not had any gesture of appreciation for their services. HKEA explained that due

[9] In 2001 Moderation Committee members were paid $710 for each meeting (lasting three hours) they attended.

to the large number of people involved (about 1,200 in total) it was not easy, and possibly very costly, to provide other forms of appreciation or recognition. As we see it, what is important is that appreciation is genuinely expressed. For instance, a simple note of thanks or a small souvenir could be effective but inexpensive means for such purpose.

STAFF MANAGEMENT

Workload

7.7 A number of Subject Officers mentioned that they had not been able to pay as much attention to some of the question papers as they liked, or should, especially in the period when all the question papers had to be printed. Other duties such as curriculum development and internal management improvement projects had added to their workload. On the other hand, some Subject Officers observed that such had always been part of their duties and the crux of the matter is time management.

7.8 Duties are assigned by the Head of the Subjects Division on the basis that generally every Subject Officer is assigned a similar number of papers. We believe there should be more flexibility. The work involved may vary from paper to paper, depending on such factors as the nature of the paper and the modus operandi of the Moderation Committee. Allowance should also be given for the different levels of experience of different officers. The prime consideration

must be the production of a high-quality question paper, on schedule and without error.

Supervision

7.9 In 2001, the team of 25 Subject Officers (at ranks equivalent to Education Officer) were under the charge of a Division Head (at a rank equivalent to Senior Education Officer) and a Deputy Division Head (at a rank between Education Officer and Senior Education Officer). The leaders considered question-setting to be a professional and highly secured matter, and did not take proactive steps to monitor the progress of individual Subject Officer's work. Subject Officers were left very much to their own devices, although there was the understanding that in case of difficulties, they could seek help from the leaders. It is human nature that, in such situations, Subject Officers would try to cope without troubling their seniors. When a Subject Officer finally sought help, it is likely to be too late.

7.10 While staff should be trusted to go about their work confidently, they should have an appropriate degree of supervision to maintain a healthy sense of discipline, vigilance, and accountability. They should also be given due guidance and timely counselling while maintaining autonomy in their work. For example, they should meet the supervising officers regularly to report the progress of the work, seek advice and raise matters of concern, if any. A number of Subject Officers interviewed indicated that they would

welcome such arrangements.

7.11 The need for positive supervision is more clearly demonstrated in the case of new Subject Officers. There are many "pitfalls" in the process of examinations administration, and one single flaw may lead to disastrous results. Case 2 is an illustration where the Subject Officer was evidently serious with her work and had exercised initiative in improving the question paper development process. She had served as a Moderator and Setter for many years before joining HKEA as a Subject Officer but, despite her experience, still fell prey to the pitfall. With better guidance and supervision, the unfortunate mistake might well have been avoided.

7.12 Similarly, special attention should be given to officers acting in a new post. In Case 10, the flaw could have been avoided if the Senior Administrative Assistant, acting temporarily for the Chief Administrative Assistant, were given clearer instructions of his work and adequately supervised.

Documentation

7.13 Judged from the question paper development files of 2001, there was no clear policy on how records should be maintained. In many cases, some draft papers were missing and in most cases, reports by the Independent Assessor or the Language Polisher were not included. A good record system is

key to efficient and effective administration. This Office believes in green efforts and discourages unnecessary paperwork. However, it is good practice to keep proper records. In the case of HKEA, records of the development process of every question paper would offer ready reference for the Subject Officers and Moderation Committee members and enable the Head of the Subjects Division to keep track of progress, so that prompt advice and timely assistance can be given.

TRAINING AND GUIDELINES

Training For Subject Officers

7.14 The Subject Officer is the only HKEA staff on a Moderation Committee. Apart from serving as its secretary, he has a duty to ensure that questions are set to the standard required and HKEA policies and practices are followed. This is a delicate and difficult task, especially for new recruits. In most cases, the Chief Examiner and other members are likely to be more experienced than the Subject Officer (the basic requirement for the post is four years' teaching experience). His credibility and influence depends on his knowledge of his work. It is important that Subject Officers are adequately trained.

7.15 At present, a new Subject Officer is assigned a mentor who is an experienced colleague and would provide any guidance and help necessary. He is also provided with a

"Subject Officers' Manual" which contains guidelines on key aspects of his work. It has been pointed out, however, that as the Subject Officer works alone on the Moderation Committee he serves, it is not easy for the mentor to offer guidance or help in time. The Manual is outdated and therefore of limited use. It has been suggested by Subject Officers interviewed that training in such areas as question-setting skills and new developments in examinations and assessment studies should be provided in regular formal sessions to all Subject Officers, new and experienced.

Training for non-permanent personnel

7.16 Setters and Moderators play important roles in the development of examination questions. It has been suggested by those interviewed that they too should be trained in question setting-skills and latest concepts in examinations and assessment. Anomalies such as that in Case 4 could have been avoided if the Setter had better knowledge of the principles about use of published materials. Such training will benefit not only the two examinations, but through the non-permanent personnel, examination-related work in their respective schools as well.

Subject Officers' Manual

7.17 This is meant to be the most important guidance and reference for Subject Officers. However, the Manual (last revised more than 10 years ago) contains a great deal of outdated or irrelevant information. This explains why, as

illustrated in the cases involving proofreading errors (paragraph 4.6), the guidelines are not taken seriously or observed. To serve their purposes, guidelines and instructions must be reviewed and updated regularly.

8

REMEDIES AND IMPROVEMENT INITIATIVES

8.1 HKEA should be commended for taking measures to minimise the effect on candidates in every case where a flaw was detected. (Information on the remedial measures has been included, where applicable, in the reports at **Appendices A-J**.) The Ombudsman is satisfied that HKEA had responded swiftly on all occasions to work out the best solution available in the circumstances.

8.2 As regards improvement to the question paper development process, we note that the HKEA Council decided on 13 June 2001 that the following measures be adopted -

(a) A Code of Practice on the question paper development system would be drawn up with the checking and proofreading procedures being strengthened;

(b) Quality audit would be introduced where all the steps in the question paper development process taken by Subject Officers and examinations personnel would be documented and verified before

the examinations to ensure that the stipulated measures have been properly carried out for each paper; and

(c) More formal training would be provided for Subject Officers in such areas as management of examinations personnel, proofreading skills, and question-setting skills.

We note that action is being taken to implement these decisions.

9

CONCLUSIONS AND RECOMMENDATIONS

9.1 Our community sees the HKCEE and HKALE as having most important impact on the life and livelihood in Hong Kong, in determining whether one may proceed on higher education or secure employment with "good" pay. Examinations results are particularly valued as being recognised by many overseas institutions. It is, therefore, of paramount importance that the examinations are administered fairly and reliably. Any flaw - even one - in the system would compromise the high esteem that our examinations regime has acquired locally and overseas.

CONCLUSIONS

9.2 The Ombudsman has found the system for the preparation of question papers and the administration of the examinations basically effective and sound, though needing improvement in certain areas.

9.3 The incidents in 2001 were caused by flaws not in the system as such, but rather in implementation. Lack of vigilance was the main cause.

9.4 The Ombudsman considers that the unfortunate experience in 2001 should help all those participating in the administration of the examinations to do better in the future. HKEA's missions of providing fair, valid and reliable examinations and producing high-quality, error-free question papers should always be achieved.

9.5 The Ombudsman also hopes that releasing the findings of this investigation would allay the public concern about the system and assure our community of the integrity of the local examinations regime.

RECOMMENDATIONS

9.6 For strengthening of the administration of examinations, The Ombudsman has made the following recommendations:

(a) Duties should be clearly described for different examinations personnel, in particular Chief Examiners and Independent Assessors (paragraphs 4.4 - 4.5).

(b) Measures should be taken, by guidance notes and other appropriate means, to ensure that all persons participating in administration of the examinations

(including non-permanent examinations personnel) clearly understand their duties (paragraphs 2.8, 4.4 - 4.5, 7.2 - 7.3).

(c) Guidance notes and instructions (including the Subject Officers' Manual), should be reviewed and updated to ensure the processes relating to the administration of the examinations are accurately and clearly conveyed to those participating in the relevant processes. In particular instructions regarding the following processes should be reviewed and revised in the light of experience gained in the 2001 and thereafter:

i. proofreading of question papers (paragraphs 4.4 - 4.5); and

ii. use of published materials in questions (paragraphs 5.2 - 5.7).

(d) Training, initial and refresher, should be provided to Subject Officers on knowledge and skills essential to their work, such as principles of examinations and assessment, and skills in question-setting. Such training should

be extended to non-permanent examinations personnel (paragraphs 7.14 - 7.15).

(e) Duties of Subject Officers should be assigned having regard to their levels of experience and the specific requirements of different examination papers (paragraph 7.8).

(f) The present arrangements for supervision of Subject Officers and officers responsible for the allocation of listening test centres should be strengthened so that supervisors proactively check the progress of their work and offer guidance and assistance when necessary. Closer attention should be given to new officers and officers acting in new posts (paragraphs 6.7 - 6.8, 7.9 - 7.12).

(g) The key stages of question paper development should be recorded clearly and systematically (paragraph 7.13).

(h) The system for recruitment of non-permanent examinations personnel should be open and stand the test of public

scrutiny (paragraphs 7.4 - 7.5).

(i) Suitable recognition and appreciation should be given to non-permanent examinations personnel so as to motivate and maintain their commitment to service (paragraph 7.6).

(j) In respect of listening tests, HKEA should:

i. continue to explore better ways to conduct the tests (paragraph 6.4); and

ii. so long as radio broadcasting is still used, explore the possibility of using other radio channels with better transmission efficacy (paragraph 6.5).

10

FINAL REMARKS

COMMENTS FROM HKEA

10.1 HKEA accepts The Ombudsman's recommendations to improve the administration arrangements of public examinations as set in Chapter 9. In response, HKEA advises that the Secretariat has already initiated some improvement measures.

10.2 As regards the investigation report, HKEA considers that the investigation is very thorough and the report contains many suggestions which they find constructive and useful to help them further improve the administrative arrangements for the HKCEE and HKALE. HKEA proposes textual amendments to paragraphs 2.3, 2.4, 2.6, 3.2, 5.1, 6.2, 7.8, 7.12 and 9.6 which have now been incorporated into the investigation report.

10.3 HKEA has some reservations on recommendation (h) of the report regarding the recruitment of non-permanent examination personnel. Due to the specific requirements and the high degree of security essential to the examinations, HKEA is of the view that an entirely open system of recruitment might not be appropriate. However HKEA agrees that the system

should be more open and will consider ways to achieve this goal.

FINAL REMARKS FROM THE OMBUDSMAN

10.4 The Ombudsman is glad about HKEA's positive response. As regards the worry that by implementing recommendation (h), the security of the system may be undermined, The Ombudsman notes that section 15 of the Hong Kong Examinations Authority Ordinance (Cap. 261) provides that persons appointed under that Ordinance shall preserve secrecy of all matters coming to their knowledge in the performance of any duty. In the light of this secrecy provision, HKEA's permanent and non-permanent examinations personnel meeting the specific requirements, however recruited, are legally obliged to maintain the high degree of security essential to public examinations. The Ombudsman therefore considers that recommendation (h) should remain unchanged.

10.5 The Ombudsman would like to be kept informed by HKEA of progress on the implementation of the recommendations, and any major changes in the policy and practice on the subject matter in due course.

10.6 Lastly, The Ombudsman would like to express appreciation to the co-operation and assistance rendered by HKEA throughout the course of this investigation.

---- End ----

Office of The Ombudsman

Ref. OMB/WP/14/1 S.F. 93

March 2002

APPENDICES

A Case 1: CE Physical Education Paper 2

B Case 2: AL History Paper 1

C Case 3: AL Pure Mathematics Paper 2

D Case 4: AL Geography

E Case 5: CE English Writing

F Case 6: AL Computer Studies Paper 1

G Case 7: ASL Computer Applications Paper 1

H Case 8: CE Chinese History Paper 2

I Case 9: AL Use of English, Listening Test

J Case 10: CE English Language, Listening Test

K Errors Corrected by "Special Notices"

CASE 1 : CE Physical Education Paper 2

Problem

Questions 1 to 8 in the question paper should carry 9 marks each. In Question 4, the marks for the three component parts added up to 7 only.

4. (Volleyball)

(a) Besides setting, discuss TWO essential skills that a volleyball player should acquire.

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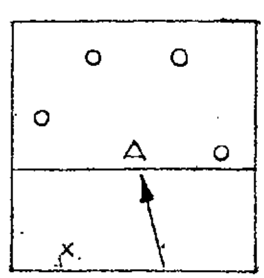
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(2 marks)

(b) Serving is an important tactic in volleyball. Analyze the functions of the following serving tactics:

△ spiker × setter ○ player ⟶ path of the ball

(i) serving towards the spiker of the opponents' team.



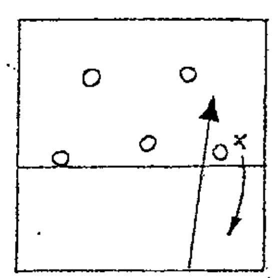
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(ii) when the setter approaches the net from position 4, serving to the left side of the opponents' court.



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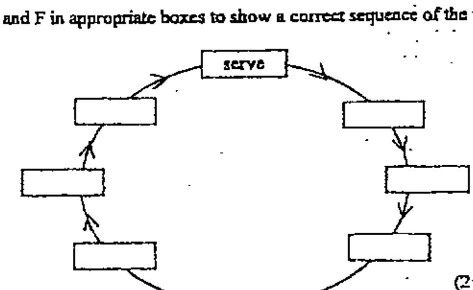
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(3 marks)

(c) Write the letters A, B, C, D, E and F in appropriate boxes to show a correct sequence of the various stages of a match.

(A) spike
(B) block
(C) set
(D) dig
(E) transition to attack
(F) transition to defence



(2 marks)

Question 4 in CE Physical Education Paper 2

Findings and Observations

(1) The draft Question 4 provided by the Setter in October 2000 contained two parts, (a) and (b). The Setter allocated 6 marks to Part (a) and 3 marks to Part (b). That was consistent with the scheme that each question carried 9 marks.

(2) When the Moderation Committee, comprising a Chief Examiner, a Subject Officer and two Moderators, scrutinized the draft question they decided to add a further part to it. The new part became Part (a). The two parts provided by the Setter, slightly amended, became Parts (b) and (c). The Moderation Committee decided that the new Parts (b) and (c) should carry 3 and 2 marks respectively. That was marked on the files of all the members. The marks to be allocated to the new Part (a) was not explicitly indicated.

(3) The Moderation Committee met five times. They finished discussing all the questions on 15 November 2000. The Committee did not meet again to check the final form of the question paper.

(4) When the Subject Officer prepared the fair copy of the question paper, he allocated to Parts (a), (b) and (c) 2, 3 and 2 marks respectively. The Subject Officer explained subsequently that he used mind work to decide the mark allocation and made the mistake.

(5) The Chief Examiner checked a fair copy of the question paper on 15 February 2001. He did not pick up the error.

(6) The problem was reported to the HKEA by an examination centre supervisor on the day of the examination. The Subject Officer advised that the marks for parts (a), (b) and (c) should be 3, 4 and 2. All examination centres were informed of the correction. Subsequently all papers were marked according to this revised marking scheme. Candidates' performance or marks were not affected in any way.

(7) The Chief Examiner told investigators that when he checked the question paper he focused on its language and content and did not pay particular attention to the mark indications. The Subject Officer said he did not re-check the marks allocated to the questions.

CASE 2 : AL History Paper 1

Problem

Different dates were given in the Chinese and English versions of Question 10 of AL History Paper 1. The Chinese version referred to "1900-45" whereas the English version referred to "1919-45".

10. 1900-45 年間，西方國家爲達致國際協調曾作出哪些嘗試？這些嘗試的成效如何？

Chinese Version of Question 10

10. What attempts were made in the West to achieve international harmony during the period 1919-45? How effective were such attempts?

English version of Question 10

Findings and Observations

(1) The Chinese version had not been revised according to a decision of the Moderation Committee while the English version had. This gave arise to the discrepancy.

(2) The question was first set in August 2000. The draft question, set in English, referred to the time period 1900-45.

(3) The Moderation Committee held 14 meetings from August to November 2000. A moderated draft question paper (English version) was produced and sent to the United

Kingdom on or about 30 November for external moderation. At this stage Question 10 still referred to the time period 1900-1945.

(4) A Chinese version of the Question paper, based on the latest English draft, was prepared in December 2000.

(5) The External Moderator provided a report dated 17 December 2000. One of his suggestions was that the time period in Question 10 be changed to 1919-1945. The suggestion was accepted by the Moderation Committee at its meeting on 13 January 2001.

(6) The Subject Officer amended the English version accordingly, but did not made the corresponding change in the Chinese version.

(7) In the next meeting of the Moderation Committee on 18 January, members examined revised versions of the question paper, but did not spot the discrepancy.

(8) The Moderation Committee met again on 3 and 9 February 2001 to finalise the question paper. Several amendments were made, but the discrepancy in Question 10 was not spotted.

(9) The Co-ordinating Chief Examiner checked the Question Paper on a day in February before it was sent for printing. He read the two language versions one after the other.

He did not compare the papers, and did not detect the discrepancy in the dates.

(10) The error was discovered by the Subject Officer on the morning of the examination. When the Co-ordinating Chief Examiner was consulted, he decided not to announce changes to the Chinese version of the question. His considerations were that some candidates might have started answering the question and that the difference in the time period would have minimal effect on the examination results, as the question would be marked on the basis of candidates' ability to present a well-argued answer rather than factual details.

(11) The papers were marked accordingly. There was no marked difference between the results of candidates taking the Chinese version and those taking the English version.

CASE 3 : AL Pure Mathematics Paper 2

Problem

In respect of Question 8 in AL Pure Mathematics Paper 2 two problems were identified:

i. In Part (a)(iii), f″(x) is stated incorrectly as containing (x-6), when it should have been (6-x);

ii. The question is similar to an example appearing in a textbook.

8. Let $f(x)=x^{\frac{2}{3}}(6-x)^{\frac{1}{3}}$.

(a) (i) Find $f'(x)$ for $x\neq 0$ and $x\neq 6$.

(ii) Show that $f'(0)$ and $f'(6)$ do not exist.

(iii) Show that $f''(x)=\dfrac{-8}{x^{\frac{4}{3}}(x-6)^{\frac{5}{3}}}$ for $x\neq 0$ and $x\neq 6$.

(4 marks)

(b) Determine the values of x for each of the following cases:

(i) $f'(x)>0$, (ii) $f'(x)<0$,

(iii) $f''(x)>0$, (iv) $f''(x)<0$.

(3 marks)

(c) Find all relative extreme points and points of inflexion $f(x)$.

(3 marks)

(d) Find all asymptotes of the graph of $f(x)$.

(2 marks)

(e) Sketch the graph of $f(x)$.

(3 marks)

Question 8 in AL Pure Mathematics Paper 2

Findings and Observations

In respect of Error in the Question

(1) In the question prepared by the Setter which was reviewed for the first time by the Moderation Committee on 15 September 2000, the particular part "(6-x)" was correct.

(2) After the first moderation meeting the Subject Officer worked through the question himself and input it into the computer. In doing so he introduced an error into part (a)(iii), where the expression "(6-x)" was transposed into "(x-6)".

(3) At the next meeting, the Subject Officer's draft question and solution, containing the errors, were presented to and was agreed by the Moderation Committee. The Committee did not re-examine the question in its subsequent meetings.

(4) The draft question paper was scrutinized by the Independent Assessor on 12 January 2001. He did not detect the error. The Independent Assessor was expected to work through the questions as if he was a candidate, but he explained that he might have ignored some steps where a question appeared to him to be all right.

(5) The Chief Examiner and the Subject Officer separately proofread the camera-ready copy of the question paper before the printing and a live question paper after it was printed. They did not pick out the error.

(6) The error was discovered after the examination on 20 April. Recommendations to redress the situation by adjusting the marking scheme of the question were made by the Subject Committee in a meeting on 26 April and were approved by the HKEA Council on 27 April.

In respect of Similarity of Materials

(7) A question similar to Question 8 had appeared in an example given in a textbook[1]. Both questions used the identical function $y = x^{2/3}(6-x)^{1/3}$, and the sequence of operations in the example was essentially identical to the sections of Question 8. (See extract from the textbook on page 5 of this Appendix.)

(8) The Setter of Question 8, a secondary school teacher who had set questions for the A-Level examinations three times previously, said that he had worked independently from his own notes.

[1] Calculus and Coordinate Geometry by Y L Ng & K M Pang, page 200 and 221, example 11.1.

(9) Members of the Moderation Committee consulted, including the Chief Examiner, a Mathematics Professor, and a Moderator who was a retired Mathematics Professor, considered that the choice of function in the question was likely to be a co-incidence. For such a question there were very few choices of constants, apart from 6, to be used because of the factor of 1/3 in the question. The Moderator, who had taught the Setter at University, testified that the Setter was a person of professional integrity and it would be unlikely that he had copied the question from a textbook, as he could have worked out such a question himself easily.

(10) The task force appointed by HKEA to investigate into problems relating to this paper and the AL History paper came to a similar view. They found that the similarity of the questions was an co-incidence and the Setter probably had been unaware of the textbook example.

≪ Example 11.1 ≫ Sketch the curve $y = x^{\frac{2}{3}}(6-x)^{\frac{1}{3}}$.

Solution y is well defined on R.

The curve is continuous everywhere.

No symmetry exists since the function $x^{\frac{2}{3}}(6-x)^{\frac{1}{3}}$ is not even and not odd.

$$y' = \frac{2}{3}x^{-\frac{1}{3}}(6-x)^{\frac{1}{3}} + \frac{1}{3}(6-x)^{-\frac{2}{3}}(-1)x^{\frac{2}{3}}$$

$$= \frac{1}{3}x^{-\frac{1}{3}}(6-x)^{-\frac{2}{3}}[2(6-x)-x] = \frac{4-x}{x^{\frac{1}{3}}(6-x)^{\frac{2}{3}}}.$$

$$y'' = \frac{d}{dx}\left[x^{-\frac{1}{3}}(6-x)^{-\frac{2}{3}}(4-x)\right]$$

$$= -\frac{1}{3}x^{-\frac{4}{3}}(6-x)^{-\frac{2}{3}}(4-x) + \frac{2}{3}(6-x)^{-\frac{5}{3}}x^{-\frac{1}{3}}(4-x) - x^{-\frac{1}{3}}(6-x)^{-\frac{2}{3}}$$

$$= -\frac{1}{3}x^{-\frac{4}{3}}(6-x)^{-\frac{5}{3}}\{(6-x)(4-x) - 2x(4-x) + 3x(6-x)\}$$

$$= -\frac{8}{x^{\frac{4}{3}}(6-x)^{\frac{5}{3}}}.$$

When $x = 4$, $y' = 0$; and when $x = 0$ or 6, y' does not exist.

When $x \to 0^-$, $y' \to -\infty$;
$x \to 0^+$, $y' \to +\infty$.
When $x \to 6^-$, $y' \to -\infty$
$x \to 6^+$, $y' \to -\infty$

x	$x < 0$	$0 < x < 4$	$4 < x < 6$	$x > 6$
y'	−	+	−	−

The curve has a minimum point (0, 0), and a maximum point $(4, 2\sqrt[3]{4})$.
On the other hand, when $x = 0$ or 6, y'' does not exist.

x	$x < 0$	$0 < x < 6$	$x > 6$
y''	−	−	+

The curve has an inflexional point (6, 0).
Next, we let $y = ax + b$ be an asymptote to the given curve, then

$$a = \lim_{x\to\infty} \frac{x^{\frac{2}{3}}(6-x)^{\frac{1}{3}}}{x} = \lim_{x\to\infty}\left(\frac{6}{x}-1\right)^{\frac{1}{3}} = -1$$

$$b = \lim_{x\to\infty}\left[x^{\frac{2}{3}}(6-x)^{\frac{1}{3}} + x\right] = \lim_{x\to\infty}\left\{\left[x^2(6-x)\right]^{\frac{1}{3}} + x\right\}$$

$$= \lim_{x\to\infty} \frac{x^2(6-x)+x^3}{\left[x^2(6-x)\right]^{\frac{2}{3}} - x\left[x^2(6-x)\right]^{\frac{1}{3}} + x^2}$$

$$= \lim_{x\to\infty} \frac{6}{\frac{\left[x^2(6-x)\right]^{\frac{2}{3}}}{x^2} - \frac{x\left[x^2(6-x)\right]^{\frac{1}{3}}}{x^2} + \frac{x^2}{x^2}}$$

$$= \lim_{x\to\infty} \frac{6}{\left(\frac{6}{x}-1\right)^{\frac{2}{3}} - \left(\frac{6}{x}-1\right)^{\frac{1}{3}} + 1} = \frac{6}{1-(-1)+1} = 2$$

Hence the curve has an oblique asymptote $y = -x + 2$, but it has no vertical asymptote because the curve is continuous everywhere.
Finally, the curve cuts the x-axis at (0, 0) and (6, 0) and cuts the y-axis at (0, 0).
With the above information, the curve is sketched below:

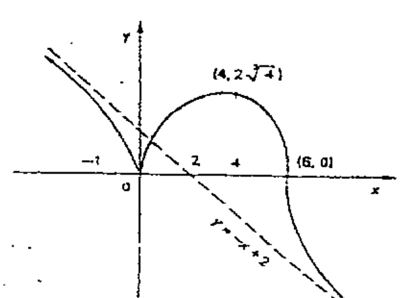


Figure 5.42

Example given in Reference Book

CASE 4 : AL Geography

Problem

Question 9 of AL Geography Paper 1 was found to resemble materials in a reference book published in the United Kingdom.

Findings and Observations

(1) On the day after the examination, it was reported in a newspaper that Question 9 was copied from a question in the 1988 United Kingdom Joint Matriculation Examination which was reproduced in a reference book. See the two questions on pages 4 and 5.

(2) A comparison of the HK question and the UK question shows the following similarities –

(i) The maps and the data provided were virtually identical;

(ii) Part (a) of the HK question and Part (a) of the UK question were similar in format. The answers to the HK question were either provided in the UK question or could be calculated in the same way as the UK question;

(iii) Parts (b) and (c) of the HK question and Part (d) of the UK question required essentially a similar approach and some of the answers were the same;

(3) Because of those similarities candidates who had seen or done the UK question before would be likely to be in a more advantageous position than candidates who had not.

(4) Question 9 was set by a secondary school teacher who had no previous experience or training in setting questions for public examinations.

(5) The Setter had attended a pre-setting meeting with the Chief Examiner and the Subject Officer, and was provided with a set of guidance notes. Paragraph III.2.(g) of the notes provides -

> "No question contained in an examination question paper and no marking scheme should be directly based on any textbook or textbooks, revision books, notes or other publications, whether private or public. Questions should not consciously follow or closely resemble any question contained in any textbook, revision book or question papers of other examinations or previous HKEA examinations. (When direct

quotations, photographs, charts, diagrams, etc., are included in any question, the setter(s) should indicate the source(s) of all such material used on the "Source Form" provided for this purpose.)

(6) The Setter said that when drafting Question 9 he had referred to the reference book which he had bought in UK. He was not aware that the book might be used by schools in Hong Kong. It did not occur to him that using the UK material in such a way might lead to problems.

(7) The Setter reported the source of the question to the Subject Officer by using the "Source Form". He attached copies of the relevant pages of the UK book and gave the name of the publishers on the form as required by the HKEA.

(8) The Moderation Committee was not aware of the background of the question. The Subject Officer said he had not brought the matter up at the moderation meetings as he did not see any problem with the Setter's approach.

9. Figure 9a shows the position of Bridgewater, S.W. England and its neighbouring trading centres. Table 9b shows the population of these centres and their distances from Bridgewater.

Figure 9a

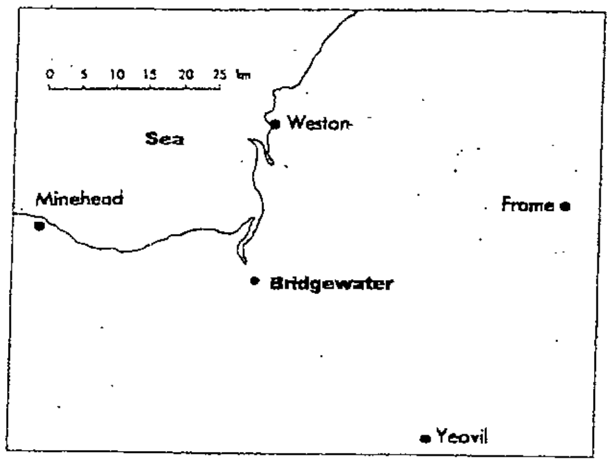


Table 9b

Centre	Population	Road distance from Bridgewater (km)	Break-point distance from Bridgewater (km)
Bridgewater	26 598	0	0
Weston	50 794	24	X
Frome	13 384	46	Y
Yeovil	25 492	32	16.2
Minehead	8 063	34	21.9

(a) Reilly's break-point equation is used to calculate the sphere of influence of a trading centre. Using the following equation, calculate the break-point distances X and Y in Table 9b. (2 marks)

$$d_k = \frac{d_{ij}}{1+\sqrt{\frac{pop\ i}{pop\ j}}}$$

where i = a trading centre
j = Bridgewater
k = the break point between i and j
d_k = distance of break point k from j
d_{ij} = road distance between i and j
pop i = population of i
pop j = population of j

(b) Describe and explain the difference in the break-point distances of these centres. (7 marks)

(c) Using the data provided, justify the different orders of these centres. (3 marks)

(d) If the population size remains unchanged, what other factors can change the sphere of influence of a centre? (5 marks)

(e) Besides using the break-point equation, suggest some methods that can determine the sphere of influence of a centre. (3 marks)

Question 9 in AL Geography Paper 1

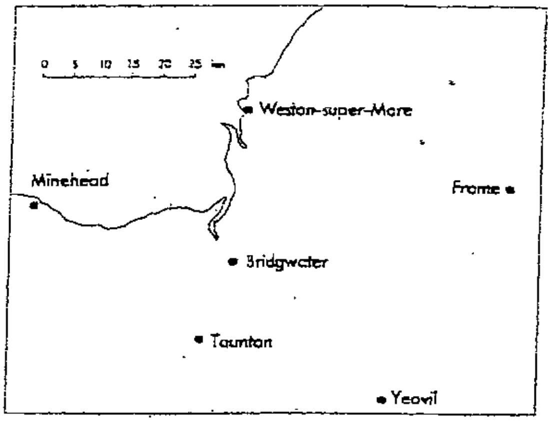


Fig. 11.24 The position of Bridgwater, Somerset

Question 5 (A data response question)

Fig. 11.24 shows the position of Bridgwater (Somerset) in relation to neighbouring service centres which compete with Bridgwater for trade in the area.

Table 11.3 presents data relating to the population, retail turnover, number of shops and retail floor space for each of the service centres.

CENTRE	POPULATION	RETAIL TURNOVER £000	NUMBER OF SHOPS	RETAIL FLOOR SPACE (m^2)
Bridgwater	26 598	10 661	305	21 800
Weston-Super-Mare	50 794	21 052	646	45 900
Frome	13 384	4 749	205	11 200
Yeovil	25 492	14 439	310	29 500
Taunton	37 373	21 658	456	53 900
Minehead	8063	4 620	145	12 400

Table 11.3 Population and retail data for selected towns

The sphere of influence of a central place can be predicted by using Reilly's break point equation.

$$d_{jk} = \frac{d_{ij}}{1 + \sqrt{\frac{\text{pop } i}{\text{pop } j}}}$$

where d_jk = distance of break point k from settlement j (Bridgwater in this exercise)
d_{ij} = total distance between settlements i and j
pop i = population of settlement i
pop j = population of settlement J (Bridgwater).

An alternative method could be to substitute other indicators such as retail turnover, number of shops or retail floor space, instead of population.

a) Calculate the predicted break point between Bridgwater and neighbouring settlements using different indicators and enter the values (to 1 decimal place) in Table 11.4. You are required to calculate the 7 values omitted from the table. The distance from Bridgwater to each settlement is shown in on Table 11.4 and the distance of the break points from Bridgwater should be entered in the table. (7)

All break-point distances should be given from Bridgwater.

Table 11.4 Predicted break-point distances from Bridgwater to neighbouring settlements

Question in UK Examination Paper

CASE 5 : CE English Writing

Problem

The words "END OF PAPER", which as a standard practice are printed after the last question on every question paper, were left out on the CE English Language Writing paper. (See question paper on page 3.)

Findings and Observations

(1) The question paper was a single sheet with three questions printed on it. The words "END OF PAPER" did not appear.

(2) In the drafts examined by the Moderation Committee at its three meetings in November, those words were printed at the bottom of the page, below the picture of Question 3. The drafts were stored on the computer.

(3) After the third meeting the Subject Officer prepared a fresh draft by amending the document stored on the computer. He considered the first question was too close to the top of the page and added more space above it. As a result the words "END OF PAPER" were moved onto the next page of the document.

(4) In December 2000, the Subject Officer sent a copy of the

draft question paper to the United Kingdom for external moderation. He printed out from the computer the first page of the document, but not the second page (which contained only the words "END OF PAPER").

(5) The overseas moderator made certain comments on the content of the paper, but made no mention of the omission of the words "END OF PAPER".

(6) The draft question paper was examined again at a final moderation meeting on 17 January 2001. Certain amendments were made pursuant to the comments by the overseas moderator, but the omission was not picked up.

(7) Thereafter a final draft was prepared by the Subject Officer, which was proofread by two other English Subject Officers and the Chief Examiner before it was sent for printing in early February.

(8) When the paper was being printed at the Government Printers the Subject Officer had checked the film for printing. After the paper had been printed it was proofread again, as a special arrangement in 2001, by an examiner who was not involved in the development of the paper. The omission was however not detected until it was reported to HKEA by at the time of the examination on 5 May.

(9) The HKEA Secretariat considered the matter immediately after the examination and decided no remedial action was necessary, as candidates would not be affected by the omission.

1. One day after school, you went to the staffroom to see your teacher, but there was nobody there. Just as you were about to leave, you noticed a piece of paper on the staffroom floor. You picked it up, and saw the words 'END OF TERM EXAMINATION' at the top of the page.

   Describe what happened next.

2. Your parents have sent you away for a month to a summer school in another country. It is your first trip outside Hong Kong and in the country where you are, life is completely different from life in Hong Kong. After two weeks, you finally have time to write a letter to your best friend. Describe your experiences and how you feel about the trip.

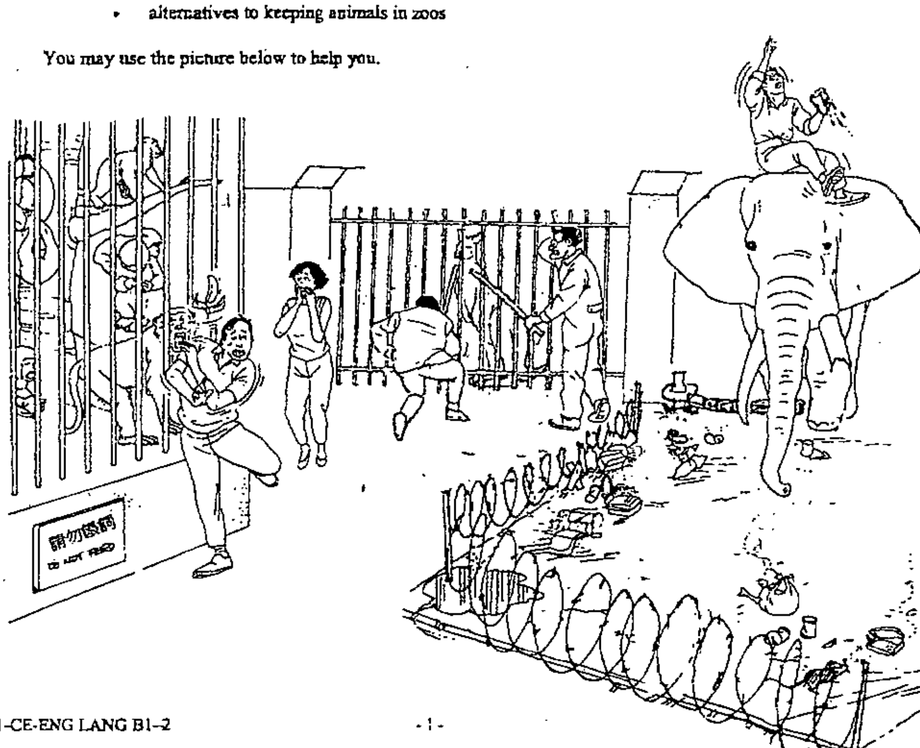
   Write your letter.

3. Recently, you visited a zoo in China. You were horrified to see the terrible conditions in which the animals were kept and the way some of the visitors behaved. You have decided to write a letter to the editor of a magazine published by the Worldwide Fund for Nature.

   In your letter, you should briefly describe what you saw. You should also write about at least TWO of the following :

   - how to improve conditions in zoos
   - how visitors should treat animals in zoos
   - alternatives to keeping animals in zoos

   You may use the picture below to help you.



2001-CE-ENG LANG B1-2 - 1 -

CE English Writing Paper

CASE 6 : AL Computer Studies Paper 1

Problem

Question 1(b) of AL Computer Studies Paper 1 contained an example which was found to be wrong.

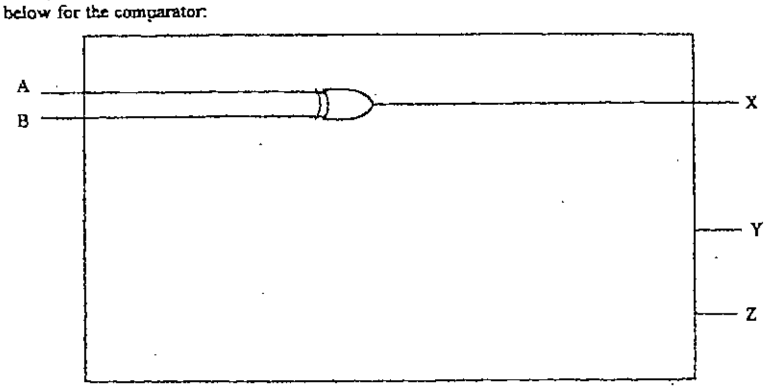
1. In an experiment, Jimmy is required to construct a single bit binary comparator with two inputs A and B, and three outputs X, Y and Z. X is 1, if and only if A = B. Y is 1, if and only if A > B. Z is 1, if and only if A < B. Jimmy has one each of the following gates: XOR, NAND, NOR, AND, OR, and NOT.

   (a) Give the simplest Boolean expressions for Y and Z in terms of A and B.

   ____

   ____

   (b) Jimmy uses the XOR gate to generate the output X. Using the remaining gates, complete the box below for the comparator:



(4 marks)

Question 1, AL Computer Studies Paper 1

Findings and Observations

(1) Question 1(b) required candidates to complete a circuit diagram for two terminals marked Y and Z. An example was given in the question using a connection to another terminal marked X. There was an error in the example and the connections given for terminal X did not produce the desired result asked in the question.

(2) The question was set by a university lecturer with expertise in the particular area of computer science. In the first draft of the question no example was included. The Moderation Committee examined it on 15 September 1999 and considered it too difficult for the candidates.

(3) The Setter produced a modified version in October which the Moderation Committee still considered too complicated.

(4) The Setter further revised the question by including an example. It was accepted by the Moderation Committee. The question was the one that appeared in the live question paper. Apparently the Moderation Committee did not work through the revised question.

(5) The final draft of the question paper was checked by an Independent Assessor. The error was not spotted. Probably the Independent Assessor, being an expert in the subject, went straight to work out the answers to the question without considering the example given.

(6) The error was reported in the press on the day after the examination. Having confirmed the problem HKEA checked the answer scripts of all 297 candidates sitting this paper. It was found that 174 candidates had obtained full marks in Question 1(b). (It is believed that those

candidates, like the Independent Assessor, answered the question without considering the example given). Mark adjustments were made for the remaining candidates such that their results in Question 1(b) were assessed by their performance in Question 1(a) (which was a related question) and Question 3 (which was a question of similar nature).

CASE 7 : ASL Computer Applications Paper 1

Problem

The question paper was found to contain a number of language errors.

Findings and Observations

(1) The following errors were spotted in the question paper after the examination –

Question	Language in the Question Paper	Correction needed
3	"*Classify each of the following eight items into one of four categories: Internet resources, protocol, operating system, or others.*"	"*the*" should be inserted between "*of*" and "*four*"
8	"*Classify each the following eight items into one of three categories.*"	"*of*" should be inserted between "*each*" and "*the*", and between "*of*" and "*three*"
10	"*The structure of the database files are as follows.*"	"*are*" should be replaced by "*is*"
10(a)(i)	"*Write SQL/command statement(s) used to list the surname, given name and telephone number of all the painters in the database with country code =086.*"	"*used*" should be deleted
10(c)(i)	"*Write SQL/command statement(s) used to list by centre the names of painters who has a picture or pictures priced 2000 or more in that centre.*"	"*used*" should be deleted; "*a*" should be added between "*by*" and "*centre*"; "*has*" should be replaced by "*have*"

(2) The final form of the questions was decided by the Moderation Committee. The original questions drafted by the Setters had been changed to various extents during the moderation process.

(3) The Chief Examiner explained that when the Moderation Committee considered the questions they focused on their subject content rather than the language. He believed that any language problems would be taken care of by the Language Polishers.

(4) The Chief Examiner said that when he proofread the camera-ready copy of the question copy he again focused on the subject content rather than the language.

(5) The HKEA Secretariat considered the paper immediately after the examination and decided no remedial action was needed, as the errors would not affect candidates' performance.

CASE 8 : CE Chinese History Paper 2

Problem

In one of the multiple-choice questions, all the choices provided were wrong.

Findings and Observations

(1) The question paper contained 55 multiple-choice questions. The one in question was Question 43, about what the people's demands were in the "May 4 Movement".

43. 下列各項，何者為五四運動爭取之事項？

(1) 罷免曹汝霖、章宗祥、陸徵祥
(2) 取回山東權益
(3) 棄帝制，行共和
(4) 禁止輸入日貨，保障國貨

A 只有(1)、(2)
B 只有(3)、(4)
C 只有(1)、(2)、(4)
D 只有(2)、(3)、(4)

Question 43 in CE Chinese History Paper 2

(2) The question referred to four statements. Statements (3) and (4) were incorrect. Statement (2) was correct. Had statement (1) been correct choice answer "A" would have been the correct answer.

(3) Statement (1) referred to three officials who the people demanded to resign. The Setter explained that he intended to give the correct names. The first two names did not pose any problem. The third name should be "陸宗輿", but he had included the name "陸徵祥" instead. (It is noted that both persons were historic figures at the relevant time, and both bore the same surname.)

(4) The Setter said that he had relied on his memory when he designed the question and had not checked against textbooks.

(5) The Moderation Committee met eight times and examined each of the questions in the paper. All members, including the Subject Officer, were or had been Chinese History teachers. They did not spot the anomaly.

(6) As a special arrangement for 2001 the question paper was rechecked by one of the Moderators prior to the examination. The error was not detected.

(7) The anomaly was reported in the media after the examination. HKEA decided that Question 43 would not be counted and the marking scheme was adjusted accordingly.

CASE 9 : AL Use of English, Listening Test

Problem

An Listening Test centre at Tai Kok Tsui which had shown signs of radio transmission problem in 2000 was still used in 2001. A large number of candidates sitting the AL Use of English Listening Test there were adversely affected by poor radio transmission.

Findings and Observations

(1) Candidates scheduled to sit the listening test in the school hall found immediately before the examination that they had difficulties in receiving the radio broadcasts. 55 of the 133 candidates were moved to special rooms where they listened to the broadcast through radio sets installed by the school. The remaining 88 candidates continued to take the test in the school hall.

(2) The school was used as listening test centre for the first time in 1999. Prior to that a radio transmission test was conducted in accordance with HKEA practice. The result was found to be satisfactory. In that year only two candidates at the centre complained of radio reception difficulties.

(3) In the 2000 AL Listening Test 20 candidates at the centre had to use the special room facilities because of radio reception difficulties. HKEA guidelines at that time provided that any centre with more than 20 candidates using special room facilities would not be used for listening examination again in the following year. The school was not excluded, apparently because the figure 20 was not exceeded.

(4) The exam centre in question, with a seating capacity of 150, was smaller than the average school hall.

(5) After considering the reports by the examiners at the centre, and an exercise involving comparing the statistics about the performance of candidates, there was evidence that candidates taking the test in the hall had been affected in their performance. Mark adjustments were awarded to them.

CASE 10 : CE English Language, Listening Test

Problem

A school in Chai Wan which had been found to have difficulties in receiving radio broadcasts and thus unsuitable for holding listening tests, was used as an examination centre for the CE English Language Listening Test.

Findings and Observations

(1) During the time for candidates to tune and test the radio reception before the formal beginning of the examination, most of the candidates at the school hall found difficulties in receiving the radio broadcast. Examiners and staff of the school arranged to move the candidates to "special rooms" where each was equipped with a transistor radio broadcast the test. A total of 162 candidates were placed in five such "special rooms". 26 candidates who did not have difficulty in receiving radio transmission remained in the hall to take the test. The arrangements were completed before the test began.

(2) It was a new school and the hall had not been used as a listening examination centre previously. A team from HKEA visited the school hall in December 2000 and tested whether radio broadcast could be received satisfactorily. The result was negative. A report was prepared, with the

remark " Radio reception tested and found unsuitable for listening tests".

(3) That team visiting the centre was responsible for arranging AL examination centres. They decided not to use the school hall for AL listening tests. They passed the report to the team responsible for arranging CE examination centres.

(4) At that time the officer responsible for arranging CE examination centres, a Chief Administrative Assistant, was on leave. The officer acting in his place included the school as a centre for the CE English language listening test. The officer explained that he had not checked the report but had included the school in the list in the belief that it was suitable.

(5) The answer scripts of the candidates in this centre were analysed by HKEA. It was found that their performance had not been affected.

Errors Corrected by "Special Notices"

No.	Question Paper	Correction
1	CE Chinese History Paper 2	In Question 31, the word "塲" should be amended as "場"
2	CE Computer Studies Paper 1A	In Question 4, "as" should be deleted from "A sample output is shown as below"
3	CE Computer Studies Paper 2	In Question 19, "playing computer game" should be amended as "playing computer games"
4	ASL Engineering Science Paper 1 (Chinese version)	In Question 7(d), "電滋波" should be amended as "電磁波"
5	CE English Language (Syllabus A) Paper 4	In Question Paper version 9.2, "talk him/her" should be amended as "talk to him/her"
6	CE English Language (Syllabus B) Paper 4	In Question Paper version 12.1, "at (the) evening" should be amended to "in (the) evening"
7	CEE English Language (Syllabus B) Paper 4	In Question Paper version 17.1, "activies" should be amended as "activities"
8	CE Geography Paper 1	In Figure 3 of Question 3, "sendiment" should be amended as "sediment"
9	CE Geography 2 (Chinese version)	In the title of the map, "香中學會考" should be amended as "香港中學會考"
10	CE History Paper 1	In Question 4, "Billions of Dollars" should be amended as "Billions of US Dollars"
11	AL Chinese Language and Culture Paper 1A	In Question 4, "己" should be amended as "已"
12	AL Chinese Language and Culture Paper 1B	In Comprehension Passage 2, "硏" should be amended as "研"
13	AL Chinese Literature Paper 1B	In the playscript provided, words attributed to "虞姬" should be attributed to "牛郎"

14	AL Computer Applications Paper 1	In Question 3, the punctuation mark 「」 should be included to enclose each of the four expressions 互聯網資源, 協定, 操作系統 and 其他
15	AL Computer Studies Paper 2	In Question 12(b), "CPMX" should be amended as "CMPX"
16	ASL Ethics and Religious Studies	In question 1, "上斷頭台" should be deleted from "卡登冒充情敵上斷頭台受死"
17	AL Liberal Studies (The Modern World)	On the front page, the time duration of the examination was wrongly written as "8.30 am – 11.00 am". It should be "1.30 pm – 4 pm"
18	AL Liberal Studies (Science, Technology and Society)	On the front page, the time duration of the examination was wrongly written as "8.30 am – 11.00 am". It should be "1.30 pm – 4 pm"
19	AL Liberal Studies (China Today), Chinese version	On the front page, the time duration of the examination was wrongly written as "上午八時三十分至上午十一時". It should be "下午一時三十分至下午四時"
20	AL Music Paper 2	A revised version of page 1 of Question 1 had to be issued to candidates because some signs had not been provided in the original version
21	AL Principles of Accounts Paper 2	The question on page 5 was not numbered. It should be numbered as Question 5